Disney

5C

SCIENCE in COMICS

Cities of Tomorrow

THE CASE OF THE SUSTAINABLE FUTURE

Disney COMICS

Disney **Science in Comics** is a series of comics titles designed to build a sound knowledge base for kids 8–12 years old, on science themes related to features and secrets of the world around us.

In this fast-changing world, the future of cities will greatly impact the future of life on Earth. Science and Technologies can help developing sustainable cities able to meet the social, economic, and environmental goals of the United Nations 2030 Agenda for Sustainable Development. This book shows you how.

CITIES OF TOMORROW: *THE CASE OF THE SUSTAINABLE FUTURE*

SCIENCE CONTENT AND TEXTS
Scientific Committee: Dr. Francesca De Filippi (Associate Professor in Architectural Technology, Politecnico di Torino University, Turin, Italy), Dr. Chiara Anzolini (Geoscientist and Science Communicator), Prof. Fabio Fracas (Adjunct Professor in Physics Applied to Radiology, University of Padua, Italy), Dr. AnnMarie P. Thomas (Professor of Engineering and Business at the University of St. Thomas, Director of the Playful Learning Lab, St. Paul, Minnesota, USA), Andrea Vico (Science Journalist and Writer), Dr. Qin Zhang (Chinese Art Media Lab Associate Researcher, Department of History of Art and Architecture, Harvard University, USA)
Scientific Committee Coordinator: Prof. Fabio Fracas
Lead Scientific Consultant: Dr. Francesca De Filippi
Scientific Editor: Dr. Chiara Anzolini
Authors: Elena Peduzzi and Dr. Francesca De Filippi for Book on a Tree Ltd.
Translations: Sarah Ponting, Emma Cianchi and Ailsa Wood for Book on a Tree Ltd.
Editors: Barbara Gozzi and Silvia Dell'Amore for Book on a Tree Ltd.
Art Notes: Jacopo Olivieri for Book on a Tree Ltd.

COMIC SCRIPTS AND CHARACTER FILES
Jacopo Olivieri for Book on a Tree Ltd.

Back Home
Layout: Benedetta Barone; clean, ink and paint: Watermark Studio
Pops Hopp's Crops
Layout: Marino Gentile; clean and ink: Sara Storino; paint: Watermark Studio
Who's Dumping What?
Layout, clean and ink: Andrea Greppi; paint: Watermark Studio
Don't Lose Your Bottle
Layout: Emilio Urbano; clean and ink: Watermark Studio; paint: Watermark Studio
Suspicions
Layout: Benedetta Barone; clean and ink: Watermark Studio; paint: Watermark Studio
Wild chase!
Layout: Emilio Urbano; clean and ink: Marino Gentile; paint: Watermark Studio
What Lies Beneath
Layout, clean and ink: Benedetta Barone; paint: Watermark Studio
The Trail Goes Cold
Layout: Emilio Urbano; clean and ink: Andrea Greppi; paint: Watermark Studio
Welcome To Evolville
Layout: Benedetta Barone; clean and ink: Marino Gentile; paint: Watermark Studio
Tripping Around
Layout: Emilio Urbano; clean and ink: Marco Palazzolo; paint: Watermark Studio
Lost and Found
Layout: Emilio Urbano; clean and ink: Andrea Greppi, Manuela Razzi; paint: Watermark Studio
Showdown In Bunnyburrow!
Layout: Gianfranco Florio; clean and ink: Marco Palazzolo; paint: Watermark Studio

SCIENTIFIC ILLUSTRATIONS
Blasco Pisapia

DISNEY ART ILLUSTRATIONS
Layout: Benedetta Barone, Andrea Greppi, Denise Shimabukuro; clean: Benedetta Barone, Andrea Greppi, Marco Palazzolo; paint: Watermark Studio

LETTERING
Studio RAM S.r.l.

COVER ART
Concept: Denise Shimabukuro; Layout, clean and ink: Marino Gentile; Paint: Gabriella Matta

PROJECT COORDINATION
Vito Di Domenico and Elena Silvestri Cecinelli for Book on a Tree Ltd.

CONTRIBUTORS
Dario Calabria, Elena Galli, Elena Orlandi

DESIGN AND EDITING
co-d S.r.l.

PHOTO IMAGES
© Shutterstock, © Science Photo Library

PREPRESS
LitoMilano S.r.l.

© Disney/Pixar

ISSN 2753-7382 - Disney Comic Series - The Walt Disney Company Limited - 3 Queen Caroline Street, Hammersmith, London, W6 9PE

Contents

UNIT 3 – SHARING TO LIVE BETTER

WELCOME TO EVOLVILLE 119

The Climate Crisis

- Climate change 127
- Humans and fossil fuels 128
- The effects of climate 129
- Climate refugees 130

TRIPPING AROUND 131

A New Kind of Energy

- The energy transition 141
- Renewable sources 142
- Energy communities 143
- Hydrogen 144

LOST AND FOUND 145

The Sharing Economy

- Shared spaces and services 157
- Living and working together 158
- Time banks 159
- Common goods 160

SHOWDOWN IN BUNNYBURROW! 161

Smart Cities

- Improved and smarter services 171
- Shared digital platforms 172
- Biometrics and telemedicine 173
- Challenges for the future 174

Check arena 175

WELCOME TO EVOLVILLE

Hello again, Chief Bogo!

Should we take this as you reconsidering our statements?

CHIEF BOGO

Hmmph! Not in the slightest!

But I happen to need officers to escort the mayor on a visit to the **new city district** that's being built just outta town. And I thought of you two!

Oh.

Do you find this assignment boring?

Quite the opposite, Chief! We're grateful for the opportunity and to be back on duty!

Glad to hear it!

It's certainly not as exciting as hunting down phantom polluters.

But at least it will keep you busy and prevent you from **going off on another wild-goose chase!**

Oh, certainly! Right, Officer Hopps?

Yes, sir! Thank you, sir!

CHIEF BOGO

Minutes later...

The new city district, huh? A further delay in our investigation!

You heard Chief Bogo, Carrots! At least we're back in our uniforms.

Not to mention that we haven't achieved very much so far.

Yo, Wilde! You and Hopps are with us!

Have a great day, colleagues!

You too, Clawhauser!

Hmmm! I love **Fuzzy Frizz**, but nothing beats **Snozzle Pops!** Too bad they don't make it anymore.

?!

Officer Clawhauser, what are you talking about?

I-I was referring to the Snozzle Pops factory out of town! The one they closed down after Zootopia's **deindustrialization** policies!

It was right where they're building that **experimental suburb.**

Hmmm... You don't say!

CLAWHAUSER

Nick! That bottle is identical to **the one we found!** And it looks like its production plant was right where we're going!

Do you mean...

That today's assignment has suddenly become much less boring? **Yes, I do!**

Hey... what's the rush, all of a sudden?

POLICE

Chief Bogo has given us the **least exciting** assignment ever and you're **super-excited** about it?

Erm... we're just happy to be doing our job as cops, you know?

Say, do you know anything about the place where we're headed?

I just know it's part of the new mayor's **city improvement** plan!

Yeah. Mayor Berenice Baribal's very attentive to environmental issues! As soon as she was elected, she started her mandate by building Sustainable Street, and then...

... she aimed even higher and put her mind to creating a completely new **urban area!**

EVOLVILLE: THE CITY OF TOMORROW ... Today!

Hungry? RUMINATE AT HAYBALE'S

YOUR AD HERE

POLICE

POLICE

Ten minutes later, in the new city district...

Nice to see you again, **Mr. Snoutersen!** I see we're making progress.

Evolville is almost complete, Madam Mayor! And the number of residents is increasing day by day!

POLICE

Shortly after...

Ahem...

Hello, citizens!

With its integration of different environments and animals, Zootopia has always been a metropolis that looked to the **future!**

Well, the time has come to announce that the model it represented now belongs to the **past!**

This is really great!

Ssh! I wanna hear!

What do you mean, Madam Mayor?

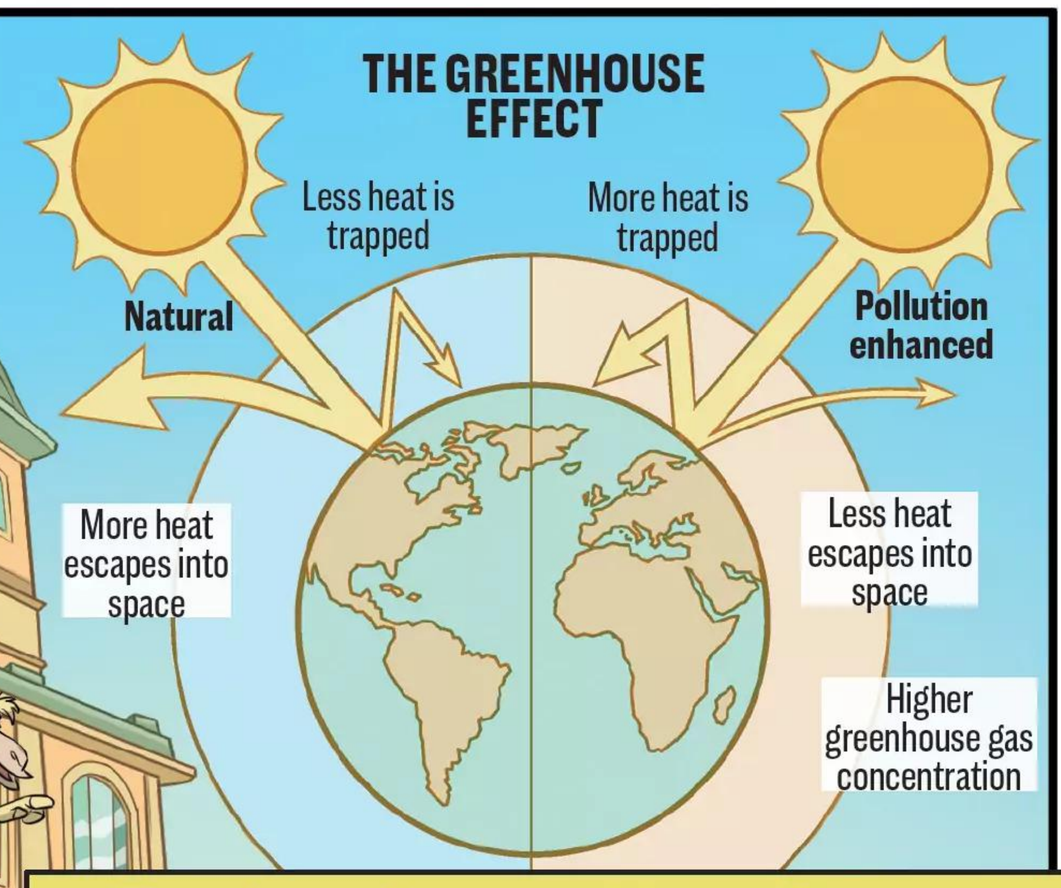
That a modern city doesn't just mean very tall buildings, like those you see everywhere in the city centers! The **well-being** of those who live there comes before everything else.

Let's face it: in the times to come, our city will have to be prepared to face some issues!

"And I'm not just talking about the **huge and polluting amounts of energy** necessary to maintain the climates in its districts..."

"Every day, more and more mammals are flocking to Zootopia from faraway places: places that are **increasingly compromised** by rising temperatures and natural disasters resulting from **climate change!**"

"This phenomenon is caused by the excessive **greenhouse effect** induced by the very pollution of the atmosphere!"



"To welcome these new citizens, of course, we need to **expand** the city even more, causing an ever-greater impact on the surrounding environment..."

Wow, day-to-day life in Zootopia is harder than I imagined!

True!

"At the same time, living in a metropolis like Zootopia, with huge distances between the districts where people live and their workplaces, comes with wasted time, expenses, pollution... and stress!"

HONK-HOOONK

BEEEEP

BRROOMMM

My promise, if I was elected, was to find a remedy for all this! Well, I have fulfilled my promise this new district is destined to serve as a model for a better Zootopia: a place built not only on **eco-friendly** principles but on more **animal-friendly** ones as well!

We are starting our **renewal** here, just a few kilometers from the metropolis! The **solutions** are all around you!

"Solutions such as **tiny houses**, which save on living spaces by exploiting small, unused spaces..."

Hello, there!

Hello!

But most important, a place where, instead of **hours**, everything you need is reachable in no more than **15 minutes!**

A really inclusive city intended for every animal, regardless of size, origin, and species! In short, ***Evolville is a more evolved city fit for everyone!***

CLAP CLAP CLAP CLAP

In a way, it will be just like Bunnyburrow!

I sense somebody's becoming a fan of the mayor!

CONTINUES ON PAGE 131

THE CLIMATE CRISIS

- Climate change
- Humans and fossil fuels
- The effects of climate
- Climate refugees

Climate change

WILD WEATHER

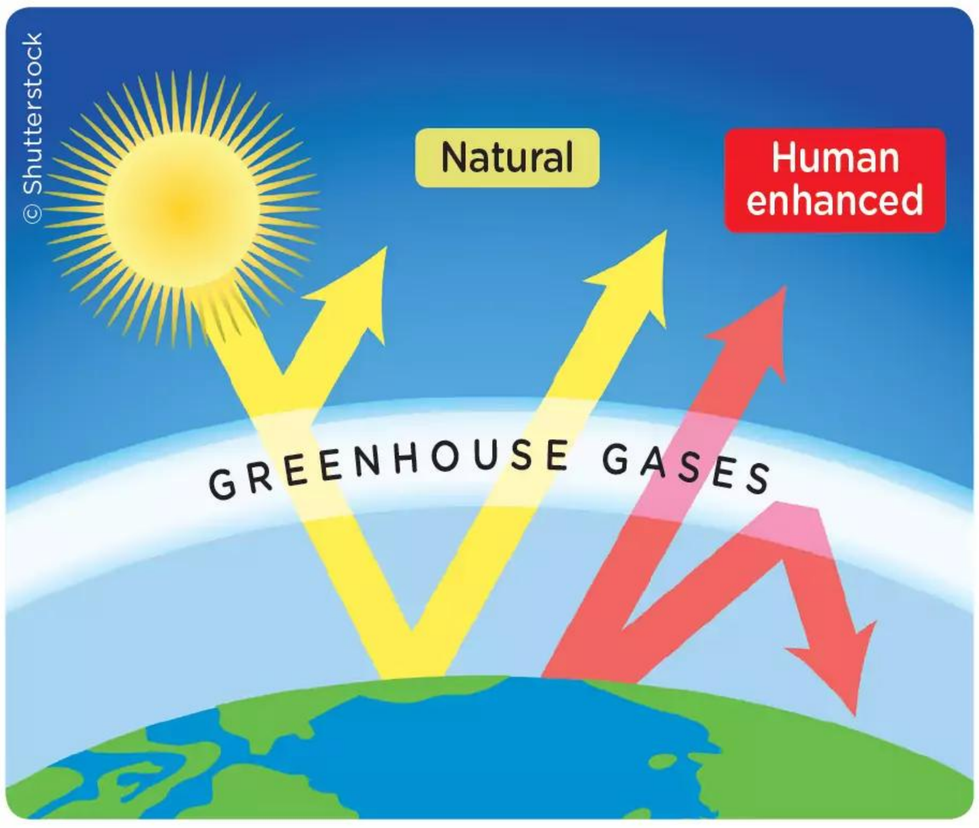
Climate is the set of weather conditions, such as temperature and rainfall, in a particular geographic area over a long period of time. To determine the climate of a place, scientists need to study its weather conditions for **decades**. Over the past 150 years Earth's temperature has risen rapidly and is continuing to do so. This phenomenon, called **global warming**, causes extensive damage to ecosystems, the organisms living in them, and the substances they need to live. Some examples are the melting of ice at the poles and the oceans heating up, endangering plant and animal species that live in those habitats. Global warming can also cause an increase in **extreme weather events**, like hurricanes, floods, and heat waves or exceptionally cold spells.

Warmer air holds more moisture, and this may increase extreme precipitation, often with record-breaking floods as catastrophic consequences.

Humans and fossil fuels

WHAT ROLE DO HUMANS PLAY?

Earth stays warm due to a phenomenon known as the **greenhouse effect**. During the day, some of the gases in the **atmosphere**—the thin gaseous layer surrounding the planet—let the sun's rays through, while at night they retain some of the heat from Earth's surface. Those gases are known as **greenhouse gases**, and **carbon dioxide** is among them. The greenhouse effect is currently increasing due to humans, since many activities, like manufacturing goods, raising livestock, growing crops, and traveling in vehicles such as cars and planes, release huge amounts of greenhouse gases into the air. This causes an increase in the heat trapped in the atmosphere, resulting in the **climate warming up**. That's why it's important to reduce emissions of these gases.



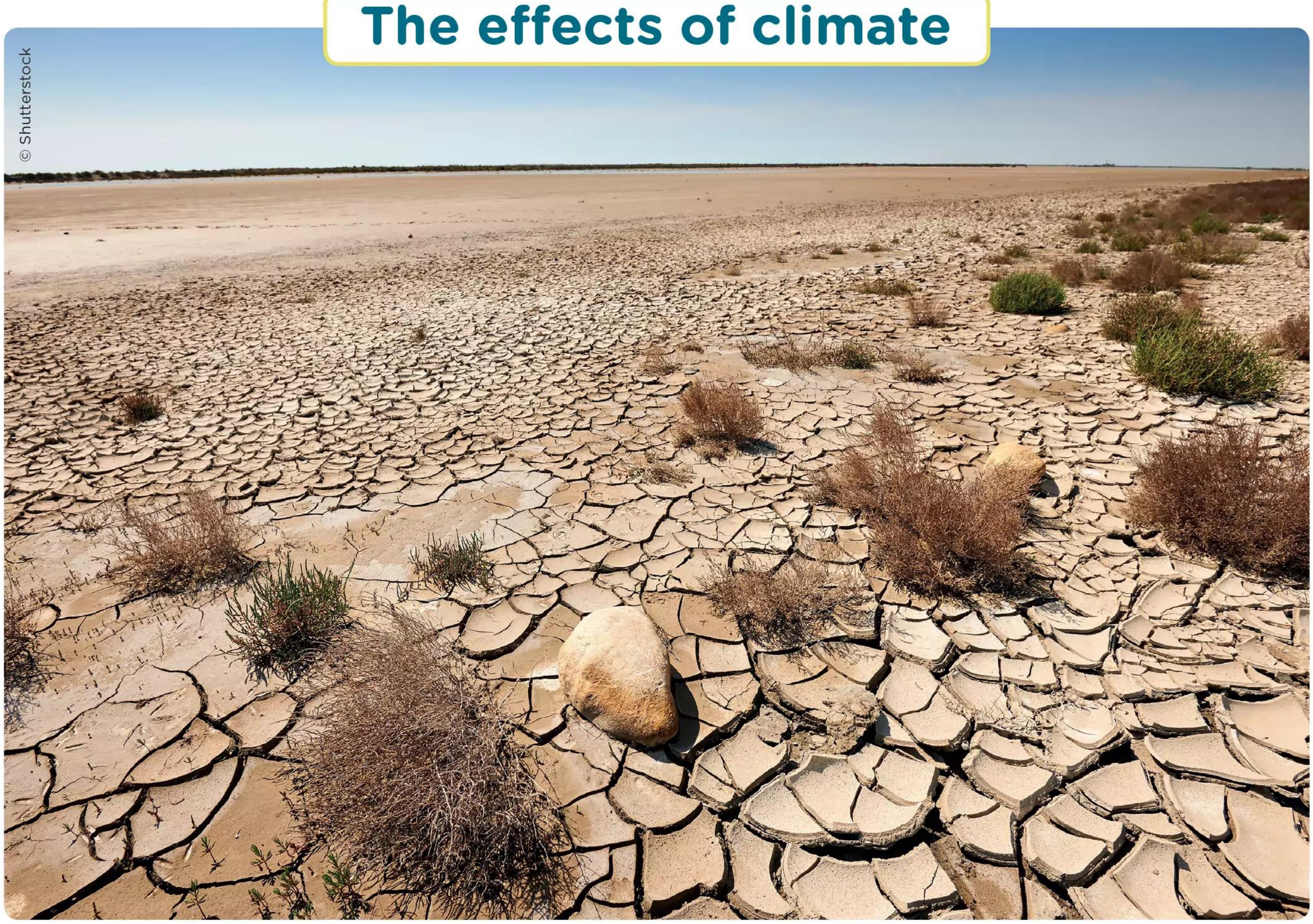
Without the greenhouse effect, Earth's average temperature would be well below freezing. When it exceeds certain limits, though, the climate warms up, and this can damage life on the planet.

FOSSIL FUELS

Machines and vehicles used by humans are powered by substances called **fuels**, which produce energy when burned. Some of these are known as **fossil fuels** because they formed from ancient plants and animals that were buried beneath layers of rock after their death. Over millions of years, they decomposed, eventually transforming into three of the fuels most frequently used by humans: **coal**, **petroleum**, and **natural gas**. However, burning these fuels produces large amounts of greenhouse gases, which warm the planet, endangering its life. That's why some countries are committing themselves to using fewer fossil fuels and, thus, reducing global warming.

Coal is derived from the decomposition of plants, and petroleum and natural gas from that of small marine organisms.

The effects of climate



© Shutterstock

Approximately half of Earth's surface that isn't covered by ice now consists of arid land, including deserts.

DESERTIFICATION

Another consequence of global warming is the increase in **desertification**. This occurs when fertile lands, rich in natural substances that make them suitable for farming and settlements, are transformed into arid areas due to high temperatures, lack of rainfall, and human activity. These are places, such as deserts, without water and resources, where life is very difficult for humans, plants, and animals.

Desertification is caused by both the increase in global warming and humans intensively utilizing the land and depleting its resources. For example, by overusing it as grazing for livestock or cutting down too many trees for timber, causing woodland and forests to disappear. What's more, humans build cities and roads, covering the soil with **concrete**, which prevents water from being absorbed into the ground, causing millions of microorganisms in the soil to die.

All these activities strip the soil of its resources, leaving it nutrient-poor and causing deserts to continue to expand. Indeed, desertification has become widespread in various parts of the world, especially in areas where it rains much less, such as Africa. This is why it's progressively **more difficult to produce food** in those areas, and consequently local people struggle to survive.

Climate refugees

FORCED TO LEAVE

Climate change can have very serious consequences for both the planet and humans. Indeed, every year people are forced to leave their land and their homes. These people who migrate, that is move from one place to another, as the conditions of the area in which they live get worse and worse are called **climate refugees**. For example, desertification can cause the soil to lose its natural nutrients so that it can no longer be farmed, resulting in food shortages. Or melting ice can cause the **sea level** to rise, making it difficult to continue to live in certain coastal locations. Other times, a **natural disaster**, like a large flood, can destroy areas where there were houses, fields, and grazing land. For all these reasons, inhabitants of those area are forced to look for somewhere else to live. Usually, they choose to move inland in their own country or to a neighboring country for convenience. However, sometimes they embark on very long journeys to reach areas with milder temperatures that still have favorable conditions to grow plants and raise livestock.

Throughout the world, natural disasters are among the main causes of human migrations.

© Shutterstock

TRIPPING AROUND

Well, I think all this seems very positive for the city, to say the least!

Now I and Mr. Snoutersen, the architect who designed the new district based on the most advanced building and energy requirements, will answer all your questions.

CLAP

CLAP

CLAP

CLAP

CLAP

Okay guys, the mayor will have finished the press conference any minute now. We'll have a lunch break of about an hour and then we'll head back to the city center!

Excellent, Officer Rhinowitz!

We have a few ideas about how we'll spend that hour!

C'mon! It's time to make the most of being here and start looking for the **old Snozzle Pops factory!**

If it's been pulled down, it's not going to be easy! Unless you have some idea where we should start... ?

No idea, I have to admit. We know nothing **about this place!**

On the other hand, if I'm not mistaken there's **someone** we know over there.

The guy from **Mystic Spring Oasis!**

You mean... what's his name? **Yax?!**

It does look like him, but... **he looks different somehow!**

Because now he's wearing clothes!

Hey, Yax!

Huh?

If it isn't our **naturist friend!** I was wondering if you happened to remember us?

Gee, I wish I did, Officer, but...

I'm Officer Hopps! A while back I came to the naturist club where you worked... ?

Hmmm... Unfortunately, I don't have a great memory, but I think I vaguely remember...

You were leading an investigation into one of our regular clients along with this other officer, but back then he was wearing a green shirt and kind of a loose necktie!

Exactly!

I moved here as soon as the first homes were completed! In all of Zootopia, there's nowhere more naturally balanced than this place! I find myself in **complete harmony here, dude!**

Which is precisely why we're talking to you!

So, it'd be fair to assume that, as a resident, you're quite knowledgeable about the surroundings of your newly built district, right?

Well, sure...

Say, would you like to take a tour?

Hm. Would we?

Yes! It's the quickest way to have a look around!

As you can see, Mayor Baribal is pretty **hung up** on the negative impact on the environment! You won't find any pollution from fuels like **coal, natural gas, and oil** here. All the cars are **electric**, and the **grooviest thing** is everything is reachable on foot or by bicycle! Dig it?

Yes, I see...

And what are those structures?

They're, like, our **houses**, man! In Evolville, every single roof is **covered in plants!**

It's good **protection** when it's too hot and too cold, from bad weather and frost. Plus, they **absorb rainwater!**

And they're great for **growing food**, as far as I can see!

TANKS FOR COLLECTING RAINWATER

SOLAR PANELS TO PROVIDE ENERGY TO THE FARM

HYDROPONICS: PLANTS GROWN DIRECTLY IN WATER

CROPS ARE EXPOSED TO SUNLIGHT

For food, we also have the large towers used for **vertical farming**, which saves a lot of space!

WITH VERTICAL FARMING, THE PRODUCTION NO LONGER DEPENDS ON THE SEASONS BUT IS NONSTOP

And as for **roof gardening**...

Hello!

Hi! How you doin' today?

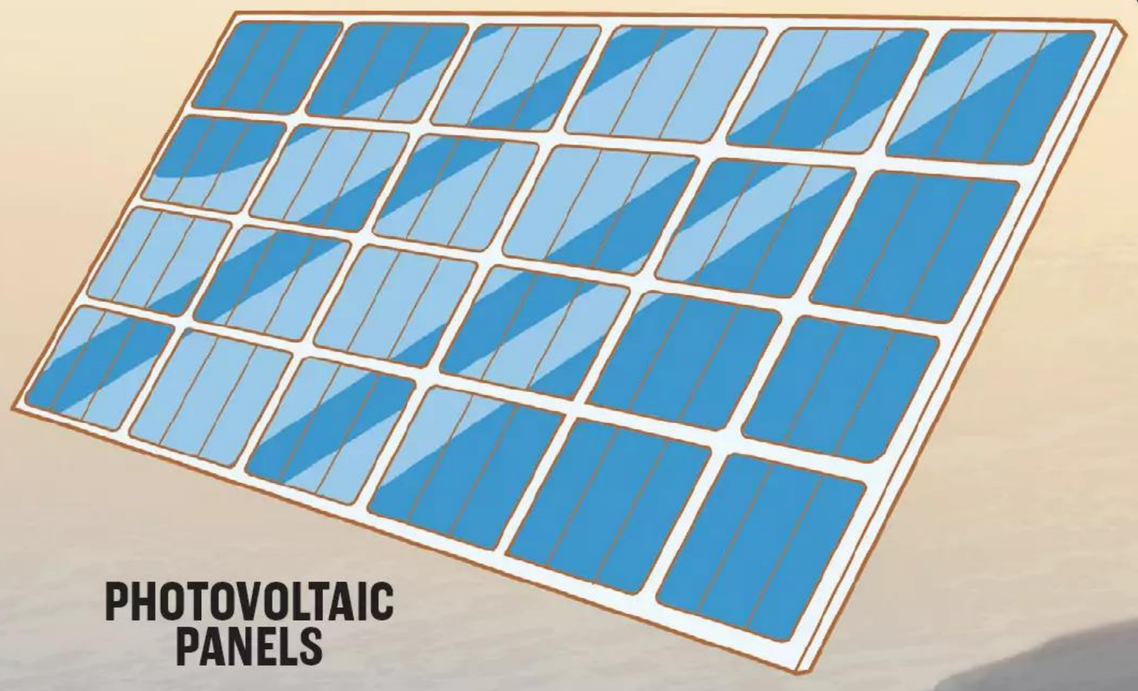
You know, having healthy, inexpensive food on hand is certainly great, but it's less important than the **good vibes** generated by **harmonious relationships** between neighbors!

That's the real progress here!

But I meant those structures down there...

Ahh, **those!**

All the energy in Evolville comes from **wind** and **solar** power, dude!



PHOTOVOLTAIC PANELS

WIND TURBINES

Both produce clean energy, from inexhaustible and non-polluting **renewable sources** like the **wind** and the **sun!**

Whoa, that's impressive!

Yeah, totally far out, isn't it?

WHIRRRRRRRR

I dunno... Going back to sources like the wind feels like a throwback to **primordial times,** don't you think?

Well, that's what we saw in my parents' fields, remember? It seems like that's the direction progress is taking!

Rightly so: Evolville's motto is "**Going back to go forward!**"

I love the strong sense of community here. It almost feels like home!

I agree, although those sure aren't bunny rabbits!

Ah, **community** is the key word here!

Did you know that even energy is **community managed?**
Huh... no, we didn't.
We have **energy communities** where citizens own and participate in renewable energy and energy efficiency projects!
Meaning what?
Meaning that groups of citizens get together and decide to install systems that **produce and use energy** from renewable sources! This way, they contribute to speeding up progress toward the final goal: **only using clean energy!**
All this means significant benefits for the **environment,** the citizens' wallets, and their general **well-being!**
It does sound pretty... harmonious!

Not to disturb the harmonious vibe, Carrots, but we're running out of time and we still have to **find**--

You're here to find something?

That's right, Yax. We're looking--

Then you've come **to the right place!**

This is the **local market!**

CONTINUES ON PAGE 145

A NEW KIND OF ENERGY

- The energy transition
- Renewable sources
- Energy communities
- Hydrogen

The energy transition

ENERGY OF THE FUTURE

Until the end of the twentieth century, the energy produced by humans came mainly from fossil fuels, nonrenewable sources that produce greenhouse gases. However, Earth's population is increasing and therefore requires more and more energy. To respond to current energy needs, it's better to use **renewable energy sources**. In fact, they **regenerate** and, consequently, even when large amounts are used up, there's no risk of them running out; also, they're **environmentally friendly**, since producing and using them results in less pollution. Furthermore, they're steadily becoming **cheaper and more accessible**, as the cost of generating renewable power has fallen sharply in recent years thanks to technology improving, production increasing, and supplies being managed more efficiently.

© Shutterstock

More and more of the electricity generated in the world comes from renewable sources, such as wind power.

Renewable sources

WHAT ARE THEY?

Renewable energy can be obtained from various types of natural resources available in the world. One of the most important energy sources is the sun. Its rays can be captured by **solar or photovoltaic systems** to generate energy. These systems consist of high-tech panels, arranged on the roofs of buildings or on the ground, which can transform the sun's heat into electrical energy.

Wind, too, can be used to generate renewable energy, known as **wind power**, by moving wind turbines that produce electricity. So can water, both from ocean currents and from rivers and lakes. In this case, the energy is generated in **hydroelectric power stations**, which transform the power of moving water into electrical energy. Last, energy can even be produced from waste. This is called **biomass** and consists of organic substances, such as food waste, that generate energy when burned.

THE ENERGY TRANSITION

The move from using nonrenewable energy sources to renewable ones is called **energy transition** and is already underway. In 2030, the amount of energy from renewable sources will be four times as high as it is today. However, more and more energy is predicted to be needed, particularly in cities, where many people live. That's why it's important to use **technological advances** to seek new and efficient ways of using renewable energy sources, and storing the power generated so it can be used when required.

An electric car can be charged using the wind or the heat of the sun transformed into energy by wind turbines or solar panels.

Energy communities

ENERGY FOR ALL

The use of renewable energy sources has resulted in the creation of **energy communities**. These are groups of people—families, municipalities, companies, and commercial entities, such as stores and restaurants—that produce, use, and share energy with each other, relying on the natural resources available where they live. Each group builds systems to generate renewable energy, for example, solar panel systems, and the energy produced can be used immediately or stored to be used when needed.

Additionally, the **energy is shared**, meaning that when a member of the group produces more than they require, they can give it to someone else who needs it. This reduces costs, because each system produces energy for several families and businesses instead of a single home or store. As a result, energy is **more easily accessible**.

This is why energy communities are important and will become even more so, while large power stations, including those in other countries, may become less necessary. In fact, people will be able to generate energy themselves and share it with others, enabling **savings and causing less pollution**!

A *smart grid* is a network that distributes energy intelligently among the members of an energy community.

© Shutterstock

Hydrogen

In the future, hydrogen could be increasingly used as a fuel: hydrogen-powered planes, for example, which are as fast as traditional ones, would emit only water, which doesn't pollute.

© Shutterstock

A FUTURE SOLUTION?

One renewable energy source that is increasingly being used is **hydrogen**. Hydrogen is a chemical element, a pure substance, which can be used as a **less-polluting fuel**, since greenhouse gases aren't emitted during energy production fueled by hydrogen.

Hydrogen can be used instead of gasoline as a fuel for vehicles, but also in place of coal in certain industrial plants. Fortunately, the universe contains large amounts of this element; in fact, it's the most abundant one of all. For example, on Earth it can be found in living organisms and water, which is actually composed of oxygen and hydrogen. However, it's very difficult to find hydrogen in its pure state, not combined with other substances. That's why, to be used, **it needs to be obtained in other ways**, such as extracting it from water by **electrolysis**, a process that uses electrical energy to separate hydrogen from oxygen. And when that electrical energy is generated from renewable sources, the hydrogen obtained from the process is also called renewable. It's currently still expensive to use hydrogen, but in the future it could become one of the most important energy sources.

LOST AND FOUND

So, this is the neighborhood flea market?

Oh, not **THE** market, but one of many! There are lots more spread over the district.

Remember: in **Evolville** everything is arranged to be easily accessible!

CLOTHES

CINDY'S CDS

VINTAGE MUSIC

Gazelle

ALL FOR 4 BUCKS

I love flea markets! You can find interesting stuff, and bargain prices...

And lots of junk, too!

Wandering Herds
Emily Donkë's

FRANKENSTOAT

The Big Hibernation

Jane Nesbing's
PRIDE and PREJUDICE

In Evolville, we prefer to put **used items** back in circulation, instead of throwing them out! And in more ways than one!

Meaning **what?**

For example, you see over there?

There you can **rent** clothes and other things!

RANDY'S CLOTHES FOR RENTAL

SUSAN'S SWAPPALOOZA

While over there, when you don't need something anymore, you can **give it** to someone who does need it in exchange for something **you** need!

So, it's actually a form of **bartering!**

You guessed it, dude!

So, once again, we're going back to the old ways.

This is another way to give everything that can be reused a **second life** and prevent waste.

And so is that, over there!

Here you can get **loans!**

TIME BANK

Loans... of what?

Why, **time**, of course!

You guys loan **time** here?!

Sure, man! In our community, we dedicate part of our leisure time to **helping others**, a service which is repaid in kind!

"Everyone places **the skills they have** at the service of others, in exchange for another service!"

"Tomorrow morning I have to paint the walls of my **coworker's** home. And she'll paint **a portrait of me!**"

Coworker... ?

Sure!

"We share work spaces here too!"

GROOVY HOOVES
shiatzoo massages

PAT SPAT

In short, the watchword in Evolville is **flexibility!**

This is all very nice, Yax, but...

... we were actually looking for the old Snozzle Pops factory!

The old fizzy drinks factory that used to be here, before Evolville was built?

Yes! Do you know where it is?

Ha! You're asking if I know?

Huhhh...

No.

Dang! We were so close!

Hey, hey, Carrots! It's not over yet!

We can always ask someone else!

RAZORBAX

Excuse me, ma'am, if you would be so kind as to--

TAP TAP

?

YOU again...

AGAIN?!

Don't let her get away again, Nick!

You won't dodge us this time!

CHINA 70% OFF

SWISSSSHH

Dodge these, cops!

She's not kidding around!

Neither are we!

Eek!

Good luck catching me, losers!

Who needs luck...

Wow! A chase!

?!

... when you have a good pair of **legs for jumping?**

ORGANIC FERTILIZERS

COMPOST

BONK

POMF

Yikes!

HA! Missed me, cottontail!

Bye-byeee!

Huff. Looks like she's slipped away from us yet again!

Not this time!

Whoa! She sure was in a hurry!

See? She went that way!

Compost tracks!

After all these emotions, I need to check my energy is still **harmoniously aligned!**

Pfah! You're not the only one!

Wait, are you serious? What does that thing do?

It's one of Evolville's many automated services, Officer! It's continually sending my **biometrics** to the neighborhood medical center: that way, I can keep myself constantly updated on my health!

Whoa!

Evolville sure is a **smart city!**

Yep. I wish I was **as smart as a city!**

Me too. That way, we'd be able to find what we're looking for...

Whoops! I take it back!

I'm no expert on architecture, but...

That place definitely looks like a former factory, don't you think?

What, you mean **the new playground?**

It appears this place is being **reclaimed** and gradually converted into a **public space!**

Don't look now, but there's something else appearing, over there.

Well, well, isn't this a surprise!

CONTINUES ON PAGE 161

THE SHARING ECONOMY

- Shared spaces and services
- Living and working together
- Time banks
- Common goods

Shared spaces and services

WHY SHARE?

The **sharing economy** is a way of living in which all sorts of things are shared. For example, **goods**, or objects, **spaces** like homes and offices, and even **services**, such as nanny shares. But why share things instead of buying them? First of all, sharing—hiring a vehicle or renting a space, for example—is more economical and it also allows more efficient use of available resources.

That's because sharing lets the same good be used by more people for longer, avoiding that good staying unused. Moreover, fewer of those objects need to be produced, as just one is enough for several people, resulting **in less energy being consumed**, less resources being used, and less pollution.

Smartphone apps are at the heart of the sharing economy. Some tackle food waste by selling leftover food from restaurants and shops at discounted prices.

© Shutterstock

Living and working together

COHOUSING

In addition to useful objects and means of transport—like bicycles, cars, and scooters—it is also possible to share house spaces. This is called **cohousing**. In practice, people decide to live in certain buildings and open spaces **collaboratively**, meaning they use them all together. These can be outdoor spaces like gardens or indoor ones like kitchens, play areas, gyms, laundries, and so on. A single space is used by several people, instead of each person using their own smaller one. For example, the inhabitants of the same apartment block may choose to have a vegetable garden together. This allows them to share the production and also the work and expenses to keep it clean and tidy. Cohousing also helps people get to know their neighbors better, improving socialization, and perhaps even making friends!

COWORKING

Many individuals and companies find it useful to also share work spaces. This is called **coworking** and allows several people to use **the same space** even when they do **very different jobs**.

© Shutterstock

Coworking also allows people to exchange ideas and knowledge to create new projects together.

What is important is to identify similar services that they all need: for example, an Internet connection or a reception service for clients. The shared spaces can also consist of several different rooms—such as meeting rooms, waiting rooms, libraries, kitchens, and even break rooms—that can be used for activities, but also for people to get to know each other and **establish new relationships**, important both for work and private life.

Time banks

GIVING TIME

Today, not only can goods, services, and spaces be shared, but even time can be given and received, through a **time bank**. It works a little like a conventional bank, which brings together people who lend money and those who receive it, but in this case it's time that's exchanged, and anyone can decide to participate. Time is **measured in hours**, and the people who make their time available offer to do something they're skilled at. In exchange, they can receive time from someone else skilled at a different activity. For example, an English teacher might make two hours of private lessons available every week. Their local time bank would put the teacher in touch with the person needing those two hours of lessons, and in return the teacher would receive two hours of time from someone else who can do something for them, such as pruning the plants in their garden or painting a wall in their home.

Time banking has also been used in schools since the late 1990s. A student who is good at a certain subject can help a classmate who's struggling and, in exchange, can receive lessons in a subject they find more difficult. In the end, time banks are a very efficient way of **helping each other**.

You don't need any special skills to participate in time banking. For example, you can even give your time to help someone move house!

© Shutterstock